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RESEARCH DEPARTMENT

**TRANSMITTING AERIALS FOR THE SKYE (SKRIAIG) V.H.F. TELEVISION
AND V.H.F. SOUND STATION**

Technological Report No. E-117/9
UDC 621.396.712 1966/64

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INTRODUCTION

The Skye (Skriaig) relay station came into operation on the 14th March 1966. It provides a television and sound service to the Isle of Skye (with the exception of Portree), adjacent coastal areas of Inverness-shire, Ross and Cromarty, most of the islands of Barra, Benbecula, North and South Uist and some areas in the south east of the Isle of Lewis.

SUMMARY OF INSTALLATION

Site: The site is approximately 4 km south-west of Portree, grid reference NG 451407, height 393 m a.m.s.l.

Support Structure: The support structure consists of a 57.9 m (190 ft) stayed mast of 1.22 m (4 ft) square cross section, oriented with one stay on bearing 70° ETN. The mast is concentrically enclosed by a 2.0 m (6 ft 6 in.) outside diameter metal cylinder between the levels 13.7 m (45 ft) and 35.1 m (115 ft). The mast is screened on all four faces by horizontal 12.7 mm (0.5 in.) diameter rods at 152 mm (6 in.) vertical separation between the levels 41.7 m (136 ft 9 in.) and 49.9 m (163 ft 9 in.). Provision is made for a u.h.f. cantilever topmast.

General Arrangement: See Fig. 1.

Band I

Channel: Channel 3 with horizontal polarization is used. Both vision and sound carriers are offset +16.875 kHz.

Aerial: The aerial¹ consists of six tiers each of a single tangential $\lambda/2$ dipole spaced 2.5 m (8 ft 3 in.) from the mast axis and oriented on a bearing of 295° ETN. The inter-tier spacing is 0.7λ . The dipoles are fed with equal co-phased currents. The mean aerial height is 24.4 m (80 ft) a.g.l. There are independent main feeders to each half aerial.

Power: Two 500 watt transmitters are used.

Templet and horizontal radiation pattern (h.r.p.): See Fig. 2 and Note 1.

<u>Gain:</u>	Mean intrinsic gain	6.8 dB
	<u>Deduct:</u> loss due to distribution feeder and possible misalignment	<u>0.3 dB</u>
	Mean net gain	6.5 dB
	<u>Deduct:</u> loss due to main feeder type HM11	0.3 dB
	Network loss	<u>0.6 dB</u> <u>0.9 dB</u>
	Mean effective gain	<u>5.6 dB</u>

Band II

Carrier Frequencies:	88.5 (Light), 90.7 (Third) and 92.9 (Scottish Home) MHz.		
Aerial:	The aerial ¹ consists of four tiers each of a single horizontal $\lambda/2$ dipole spaced 1.8 m (5 ft 10 in.) from the mast axis, and oriented on a bearing of 295° ETN. The inter-tier spacing is 0.5λ , and the mean aerial height 45.6 m (149 ft 6 in.) a.g.l. The dipoles are fed with equal co-phased currents. There are independent main feeders to each half aerial.		
Power:	Two 1 kW transmitters are used for each programme.		
Templet and h.r.p.:	See Fig. 3 and Note 2.		
Gain:	Mean intrinsic gain		3.6 dB
	<u>Deduct:</u> loss due to distribution feeders and possible misalignment		<u>0.2 dB</u>
	Mean net gain		3.4 dB
	<u>Deduct:</u> loss in main feeder type HM11	0.6 dB	
	Network loss	0.8 dB	<u>1.4 dB</u>
	Mean effective gain		<u>2.0 dB</u>
<u>Programme Sources:</u>	The television programme is obtained by direct s.h.f. link from Melvaig. The sound programmes are obtained via Post Office lines direct from Glen Docherty, an intermediate site where the transmissions from Rosemarkie are received. At a later date, sound programmes will be carried by the s.h.f. link from Melvaig.		
<u>Notes:</u>	<ol style="list-style-type: none">1. The preliminary aerial design was based on a theoretical prediction of the h.r.p. An accurate h.r.p. was obtained from measurements on a small-scale model (see Fig. 2).2. The aerial design was based on the theoretical h.r.p. using an equivalent cylinder for the mast. An accurate h.r.p. was obtained from small-scale model measurements (see Fig. 3).		

REFERENCE

Detailed information on the construction and dimensions of the aerials is given on the following drawings held by BBC Transmitter Planning and Installation Department.

- P.I.D. 9106.2.3A Aerial Layout on Mast
- P.I.D. 9782.2.1AO General Arrangement of Band I Array
- P.I.D. 9782.2.5AO General Arrangement of Band II Array
- P.I.D. 9782.2.2AO Band I Transmitting Dipole
- P.I.D. 9782.2.4AO Band II Transmitting Dipole

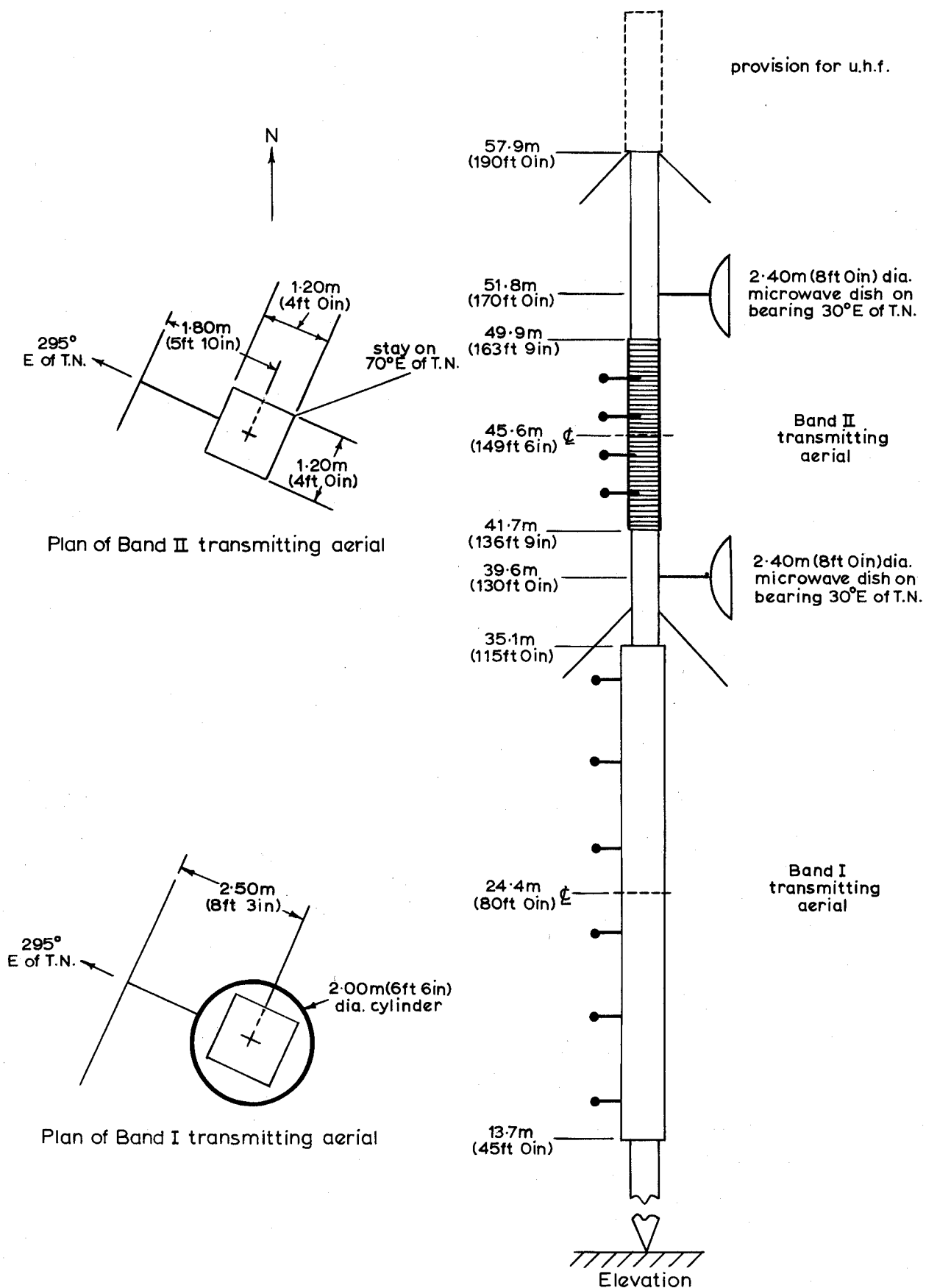


Fig.1. General arrangement of aerials on mast

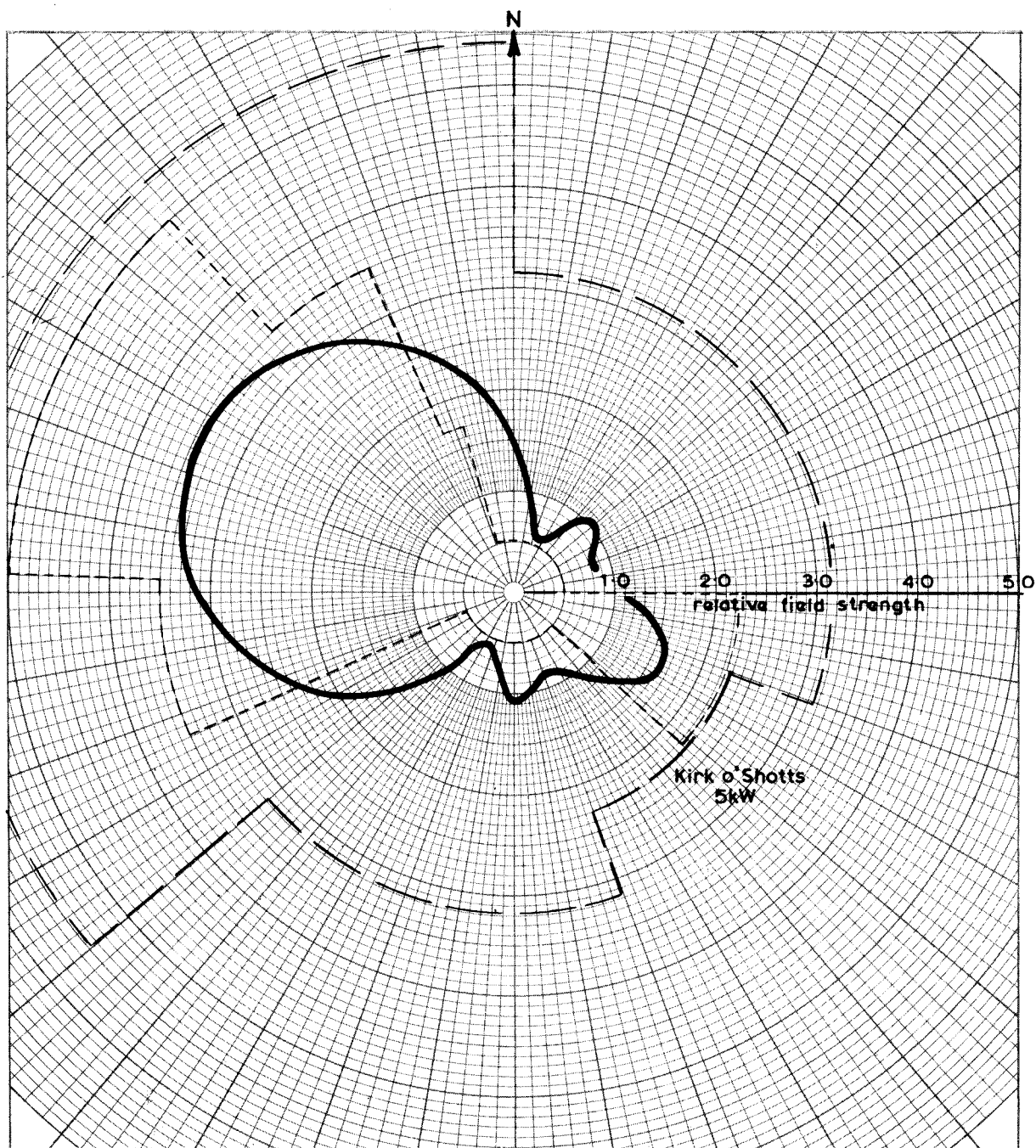


Fig. 2. Band I templet and horizontal radiation pattern
HORIZONTAL POLARIZATION

Channel 3. (Vision carrier 56.75MHz, Sound carrier 53.25MHz)

Mean effective gain : 5.6dB

Transmitter power : 1.0kW

Mean E.R.P. : 3.6kW

————— Maximum permissible E.R.P. (30kW
 where not shown)

----- Minimum desirable E.R.P.

Unit field corresponds to an E.R.P. of 1kW

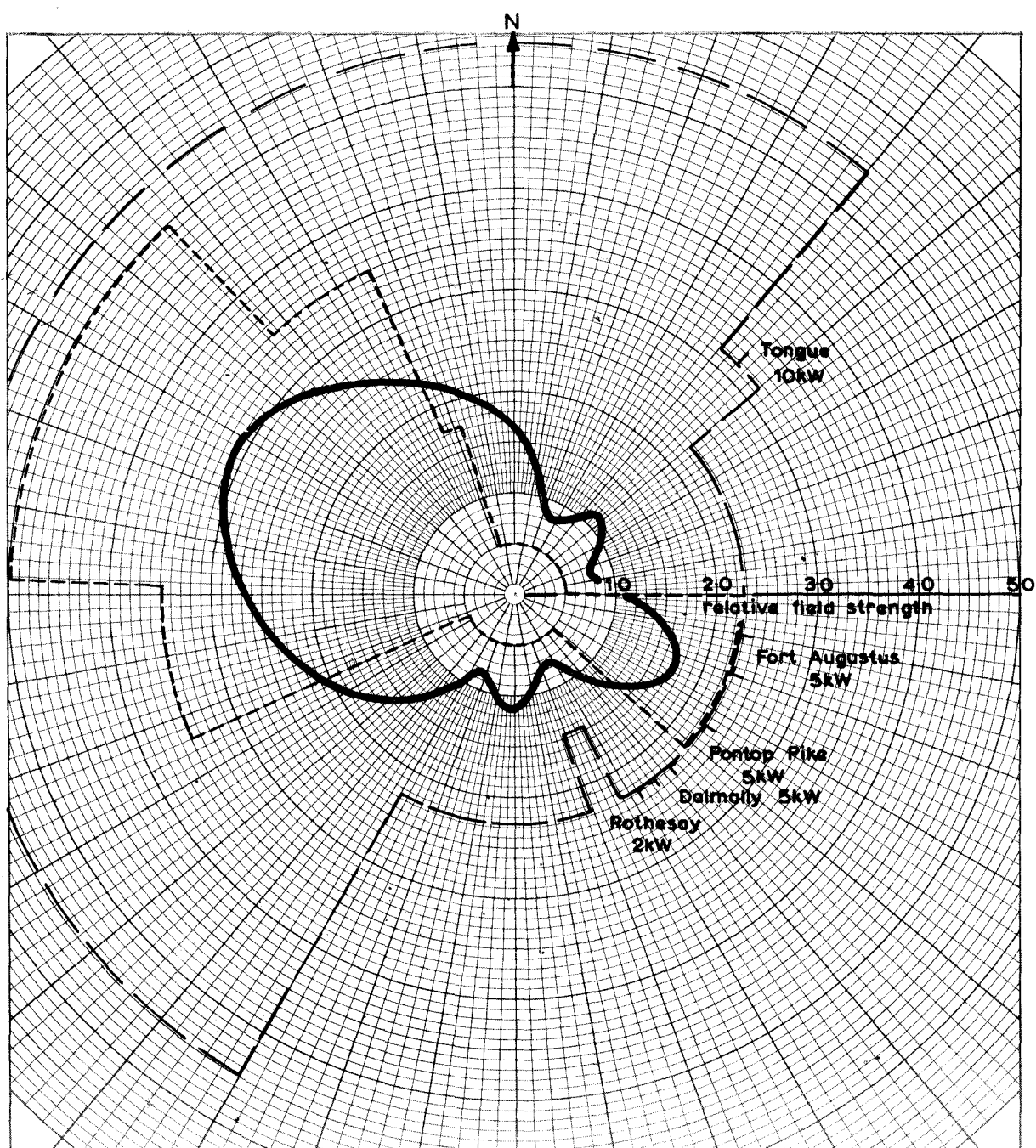


Fig.3. Band II templet and horizontal radiation pattern

HORIZONTAL POLARIZATION

88.5 (Light), 90.7 (Third), 92.9 (Scottish Home) MHz

Mean effective gain : 2.0dB

Transmitter power : 2.0kW

Mean E.R.P. : 3.2kW

————— Maximum permissible E.R.P. (30kW
where not shown)

----- Minimum desirable E.R.P.

Unit field corresponds to an E.R.P. of 1kW

